

**CLAIMS**

What is claimed:

- 1           1.       A multiple resolution sensing apparatus comprising;  
2           a plurality of first photosensor elements coupled together to form a first linear  
3           array and having a first length and a first resolution;  
4           a plurality of second photosensor elements coupled together to form a second  
5           linear array and having a second length and a second resolution;  
6           a coupler having an output, said coupler coupled to said first linear array and  
7           to said second linear array; and  
8           a controller coupled to said coupler and providing a control signal to said  
9           coupler such that said output is coupled to said first linear array when said first  
10          resolution is employed and such that said output is coupled to said second linear array  
11          when said second resolution is employed.
- 1           2.       The apparatus of claim 1, wherein said first linear array and said  
2           second linear array are placed on a single substrate.
- 1           3.       The apparatus of claim 1, wherein said first linear array, said second  
2           linear array and said coupler are placed on a single substrate.
- 1           4.       The apparatus of claim 2, wherein said coupler further includes at least  
2           one amplifier, and wherein said first linear array, said second linear array and said  
3           coupler with said at least one amplifier are placed on a single substrate.
- 1           5.       The apparatus of claim 2, wherein said first length and said second  
2           length are substantially the same and at least equal to one dimension of an image to be  
3           sensed.

1           6.       The apparatus of claim 1, wherein said coupler further comprises a  
2 switch controlled by said controller such that said switch couples said output to said  
3 first linear array when said first resolution is employed and such that said switch  
4 couples said output to said second linear array when said second resolution is  
5 employed.

1           7.       The apparatus of claim 6, wherein said coupler further comprises:  
2           a first amplifier coupled between said switch and said first linear array such  
3 that charges detected by said plurality of first photosensor elements are amplified into  
4 a first electrical signal; and  
5           a second amplifier coupled between said switch and said second linear array  
6 such that charges detected by said plurality of second photosensor elements are  
7 amplified into a second electrical signal.

1           8.       The apparatus of claim 1, wherein said first linear array and said  
2 second linear array detect a first color of light.



1           9.       The apparatus of claim 1, further comprising:  
2           a plurality of third photosensor elements coupled together to form a third  
3 linear array and having a third length and said first resolution;  
4           a plurality of fourth photosensor elements coupled together to form a fourth  
5 linear array and having a fourth length and said second resolution;  
6           a second coupler having an second output, said second coupler coupled to said  
7 third linear array and to said fourth linear array;  
8           a plurality of fifth photosensor elements coupled together to form a fifth linear  
9 array and having a fifth length and said first resolution;  
10          a plurality of sixth photosensor elements coupled together to form a sixth  
11 linear array and having a sixth length and said second resolution;  
12          a third coupler having a third output, said coupler coupled to said first linear  
13 array and to said second linear array,  
14          wherein said controller is coupled to said second coupler and said third  
15 coupler, and wherein said controller provides said control signal to said second  
16 coupler so that said second output is coupled to said third linear array when said first  
17 resolution is employed and so that said second output is coupled to said fourth linear  
18 array when said second resolution is employed, and wherein said controller provides  
19 said control signal to said third coupler so that said third output is coupled to said fifth  
20 linear array when said first resolution is employed and so that said third output is  
21 coupled to said sixth linear array when said second resolution is employed.

1           10.       The apparatus of claim 9, wherein said first linear array and said  
2 second linear array detect a first color of light, wherein said third linear array and said  
3 fourth linear array detect a second color of light, and wherein said fifth linear array  
4 and said sixth linear array detect a third color of light.

1           11.       The apparatus of claim 9, wherein said first linear array, said second  
2 linear array, said third linear array, said fourth linear array, said fifth linear array and  
3 said sixth linear array are placed on a single substrate.

1           12.    The apparatus as in claim 11, wherein said first length, said second  
2   length, said third length, said fourth length, said fifth length and said sixth length are  
3   substantially the same and at least equal to one dimension of an image to be sensed.

1           13.    The apparatus as in claim 1, further comprising a plurality of third  
2   photosensor elements coupled together to form a third linear array and having a third  
3   length and a third resolution, said third linear array coupled to said coupler and  
4   wherein said controller providing a control signal to said coupler such that said output  
5   is coupled to said third linear array when said third resolution is employed.

1           14.    The apparatus of claim 12, wherein said first linear array, said second  
2   linear array, said third linear array and said coupler are placed on a single substrate.

1           15.    The apparatus of claim 12, wherein said first length, said second length  
2   and said third length are substantially the same and at least equal to one dimension of  
3   an image to be sensed.

1           16.    The apparatus of claim 15, wherein said coupler further comprises a  
2   third amplifier coupled to said third linear array such that charges detected by said  
3   plurality of third photosensor elements are amplified into a third electrical signal

1           17.    The apparatus of claim 16, wherein said first linear array, said second  
2   linear array and said third linear array detect a first color of light.

1           18.     The apparatus of claim 13, wherein said first resolution corresponds to  
2     said first linear array having substantially 300 of said first phosensitive elements,  
3     wherein said second resolution corresponds to said second linear array having  
4     substantially 600 of said second phosensitive elements, and wherein said third  
5     resolution corresponds to said third linear array having substantially 2400 of said third  
6     phosensitive elements.

1           19.     The apparatus of claim 18, wherein said third linear array is comprised  
2     of two rows, each row having substantially 1200 of said third phosensitive elements.

1           20.     A method for multiple resolution sensing comprising the steps of:  
2             actuating a first switch residing in a coupler such that a plurality of first  
3     photosensor elements in a first linear array detect an image when a first resolution is  
4     specified; and  
5             actuating said first switch such that a plurality of second photosensor elements  
6     in a second linear array detect said image when a second resolution is specified.

1           21.     The method of claim 20, further comprising the step of disposing said  
2     first linear array and said second linear array on a single substrate.

1           22.     The method of claim 21, further comprising the step of disposing said  
2     first linear array, said second linear array and said coupler on a single substrate.

1           23.     The method of claim 21, wherein said first linear array and said second  
2     linear array are disposed on said single substrate so as to have substantially an equal  
3     length, said equal length at least as long as one dimension of said image.

1           24.     The method of claim 20, further comprising the steps of:  
2           actuating a second switch such that a plurality of third photosensor elements in  
3     a third linear array detect said image when said first resolution is specified and  
4     actuating said second switch such that a plurality of fourth photosensor elements in a  
5     fourth linear array detect said image when said second resolution is specified; and  
6           actuating a third switch such that a plurality of fifth photosensor elements in a  
7     fifth linear array detect said image when said first resolution is specified and actuating  
8     said third switch such that a plurality of sixth photosensor elements in a sixth linear  
9     array detect said image when said second resolution is specified.

1           25.     The method of claim 24, further comprising the step of disposing said  
2     first linear array, said second linear array, said third linear array, said fourth linear  
3     array, said fifth linear array and said sixth linear array on a single substrate.

1           26.     The method of claim 25, wherein said first linear array, said second  
2     linear array, said third linear array, said fourth linear array, said fifth linear array and  
3     said sixth linear array are disposed on said single substrate so as to have substantially  
4     an equal length, said equal length at least as long as one dimension of said image.

1           27.     The method of claim 24, further comprising the steps of:  
2           detecting a first color with said first linear array and said second linear array;  
3           detecting a second color with said third linear array and said fourth linear  
4     array; and  
5           detecting a third color said fifth linear array and said sixth linear array.

1           28.     The method of claim 20, further comprising the step of actuating said  
2     first switch such that a plurality of third photosensor elements in a third linear array  
3     detect said image when a third resolution is specified.

1           29.    The method of claim 28, further comprising the step of disposing said  
2 first linear array, said second linear array and said third linear array on a single  
3 substrate.

1           30.    The method of claim 28, further comprising the step of disposing said  
2 first linear array, said second linear array, said third linear array and said coupler on a  
3 single substrate.

1           31.    The method of claim 29, wherein said first linear array, said second  
2 linear array and said third linear array are disposed on said single substrate so as to  
3 have substantially an equal length, said equal length at least as long as one dimension  
4 of said image.

1           32.    The method of claim 29, wherein said first linear array, said second  
2 linear array and said third linear array detect the same color.

1           ~~33.~~    A system for multiple resolution sensing comprising:  
2           means for actuating a first switch such that a plurality of first photosensor  
3 elements in a first linear array detect an image when a first resolution is specified; and  
4           means for actuating said first switch such that a plurality of second  
5 photosensor elements in a second linear array detect said image when a second  
6 resolution is specified.

1           34.    The system of claim 33, further comprising:  
2           means for actuating a second switch such that a plurality of third photosensor  
3 elements in a third linear array detect said image when said first resolution is specified  
4 and actuating said second switch such that a plurality of fourth photosensor elements  
5 in a fourth linear array detect said image when said second resolution is specified; and  
6           means for actuating a third switch such that a plurality of fifth photosensor  
7 elements in a fifth linear array detect said image when said first resolution is specified  
8 and actuating said third switch such that a plurality of sixth photosensor elements in a  
9 sixth linear array detect said image when said second resolution is specified.

1           35.     The system of claim 33, further comprising means for actuating said  
2 first switch such that a plurality of third photosensor elements in a third linear array  
3 detect an image when a third resolution is specified.

1           36.     The system of claim 35, further comprising:  
2           means for actuating a second switch such that a plurality of fourth photosensor  
3 elements in a fourth linear array detect said image when said first resolution is  
4 specified, and actuating said second switch such that a plurality of fifth photosensor  
5 elements in a fifth linear array detect said image when said second resolution is  
6 specified, and actuating said second switch such that a plurality of sixth photosensor  
7 elements in a sixth linear array detect said image when said third resolution is  
8 specified; and

9           means for actuating a third switch such that a plurality of seventh photosensor  
10 elements in a seventh linear array detect said image when said first resolution is  
11 specified, and actuating said third switch such that a plurality of eighth photosensor  
12 elements in an eighth linear array detect said image when said second resolution is  
13 specified, and actuating said third switch such that a plurality of ninth photosensor  
14 elements in a ninth linear array detect said image when said third resolution is  
15 specified.